(19) World Intellectual Property **Organization**

International Bureau





(43) International Publication Date 15 September 2005 (15.09.2005)

PCT

(10) International Publication Number WO 2005/086062 A3

A61B 19/00 (51) International Patent Classification⁷:

(21) International Application Number:

PCT/GB2005/000874

(22) International Filing Date: 7 March 2005 (07.03.2005)

(25) Filing Language: English

English (26) Publication Language:

(30) Priority Data:

0405011.8 5 March 2004 (05.03.2004) GB 60/575,402 1 June 2004 (01.06.2004) US

(71) Applicant (for all designated States except US): DEPUY INTERNATIONAL LIMITED [GB/GB]; St Anthony's Road, Beeston, Leeds LS11 8DT (GB).

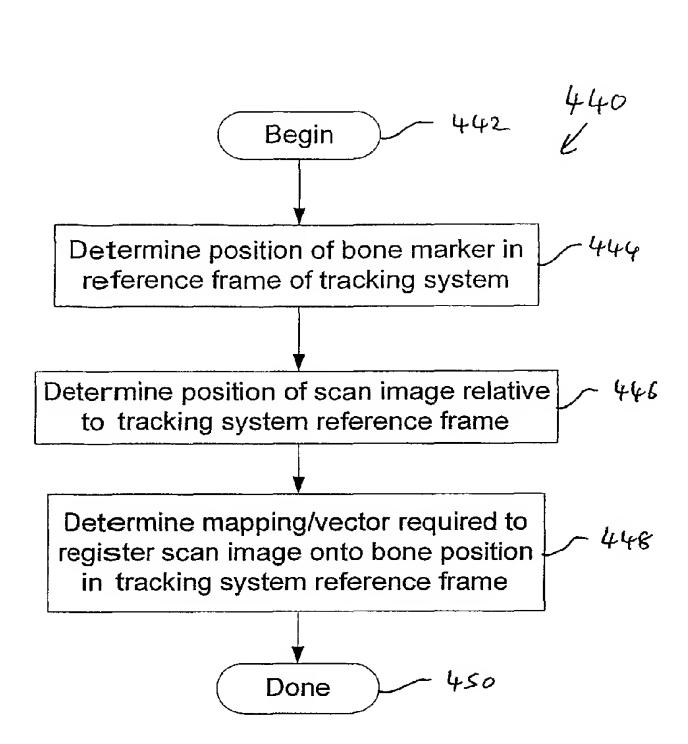
(72) Inventors; and

(75) Inventors/Applicants (for US only): REVIE, Ian [GB/GB]; Tutt House, New Row, Boroughbridge YO51 9AX (GB). ASHBY, Alan [GB/GB]; 19 Clifton Green, York YO30 6LN (GB). SLOMCZYKOWSKI, Mike [PL/GB]; 13 Hutton Gate, Harrogate HG2 9QG (GB).

- (74) Agent: ALTON, Andrew; Urquhart-Dykes & Lord LLP, Tower North Central, Merrion Way, Leeds LS2 8PA (GB).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: REGISTRATION METHODS AND APPARATUS



(57) Abstract: A method, system and computer program for generating a registered image of a body part of a patient for use in an image guided surgical procedure is described. The method includes attaching a marker detectable by a tracking system to the body part before carrying out surgical steps. The tracking system has a reference frame and the position of the marker in the reference frame is detected. A first image of the body part is captured using an imaging system. An indication of the position of the first image relative to the reference frame of the tracking system is obtained. The first image is then mapped into registration with the position of the body part. The system includes an imaging system for capturing images of the body part. A tracking system detects a marker and determines the position of the marker in the reference frame of the tracking system. A marker is attachable to the body part and detectable by the tracking system. A computer control system is configured to obtain an indication of the position of the first image relative to the reference frame of the tracking system and to map the first image into registration with the position of the body part.

A3

WO 2005/086062

WO 2005/086062 A3



GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report: 8 December 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.